

Handwritten Flowchart Generator

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- Motivation

Often when we are prototyping new ideas, a flowchart will be an ideal way to explicit our thoughts. However, it could be super time consuming to draw up a well-organized one onto our documentation files or presentation. In that sense, it would be really convenient if we can automatically generate the flowchart template with proper order informed from hand drawing chart. The product can be applied in many settings from discussion and notes in daily use to formal meetings in company or education institution. In addition, this product will be implemented in Android device for users' convenience.

- Methodology

A typical flowchart usually consists surrounding box, arrows and words. As for template generation, we just take the surrounding box and arrows into account. Using edge detection, we can extract the framework of the flowchart. Edge detection can also help to determine the direction of the flowchart for organization.

1) Edge detection

Edge detection is used to determine the boundary of each unit of flowchart. Arrows are also detected by using edge detection. Edge detection enables us to divide the handwriting chart into separate components, which is easy for further structure reconstruction.

2) Flowchart generator

We are going to render the flowchart using graphviz. Graphviz can be easily intertated into Python to serve as flowchart generator. After the components are identified, those components can be transmitted into Graphviz and recomposed into new chart.

3) Algorithm evaluation (bonus work)

A possible bonus work is to evaluate our outcome. We could use a reference flowchart by taking a photo, and compare the position of the objects between the reference flowchart and the output. The number of objective correctly detected can also be taken into account.

- **Expected Result**

The project aims to convert handwriting flow chart into well-organized electronic version. Our goal is to enable users to simply use their mobile device to take a picture of the hand-drawing chart, and then image processing would be conducted to analyze the structure of the flowchart. After that, graphviz was used to generate the well-organized chart and then export it out as an image to display on the mobile screen. Users then can use it in every setting they want.

- **Timelines**

2018/02/11 Proposal completed

2018/02/18 Related software installation

2018/02/25 Finalize algorithm development

2018/03/10 Demo version

2018/03/13 Final version

2018/03/14 Poster session

2018/03/16 Report & code submission

- **References**

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